HAWK Fakultät Bauen und Erhalten Hildesheim

Module Handbook

Bachelor of Civil Engineering

Valid since winter semester 2019/20

Hochschule für angewandte Wissenschaft und Kunst Hildesheim/Holzminden/Göttingen
University of Applied Sciences and Arts

www.hawk.de/b

The module handbook lists all the compulsory and compulsory/elective advanced modules for the Bachelor's degree program in civil engineering at HAWK. Module descriptions may be revised as required and as decided by the relevant study commission, taking full account of accreditation conditions; in particular, the range of non-compulsory specialization modules (majors) may vary depending on the actual teaching capacity available.

The compulsory modules are mandatory for all civil engineering students and take place as indicated. The modules for the first four semesters are the same and mandatory for all students. Starting in the 5th semester, students are able to refine their profiles by choosing a major:

The specialization modules are offered either in the winter or in the summer semester; the details can be found in the respective module description. Students should take this into account in good time when planning their own individual studies. A total of 4 specialization modules for the major are to be completed; 3 of these are scheduled in the fifth semester of the standard period of study, and another practical or special project is to be completed in the seventh semester in connection with the final thesis. It cannot be guaranteed that all the specialization modules will take place in the specified semester in each case; this applies in particular to modules in which the use of teaching assistants is planned.

The specialization modules are for the most part assigned to the three Bachelor majors of

- Structural civil engineering
- Water and traffic engineering
- Construction operations/construction management

If a specialization (major) is to be shown on the certificate, then 2 specialization modules, a practical or special project as well as the Bachelor’s thesis itself must be assigned to this

specialization (a total of 30 credit points). It is also possible to not to choose any specific major; then the specialization modules can be combined as desired.

A basic offer with the required minimum number of specialization modules for the major selected is only ensured in the winter semester; students are not entitled to have any specific specialization modules take place. Specialization modules with fewer than 5 participants cannot be held. These constraints, necessary for the maintenance of an orderly lecture schedule, must be taken into account by the students in the individual planning of their course of study.

It is strongly recommended that students choose the specialization modules, the practical semester, the practical project as well as the final thesis including the corresponding preparation module with great care and that they combine their courses in the best possible way. To do so, students are strongly advised to seek academic counseling.

The Bachelor's degree awarded upon completion of the program is a first professional qualifying degree at Level 1 of the Qualifications Framework for German Higher Education Qualifications. The degree qualifies the student to enter studies at Level 2 (Master's programs).

Module overview:

Module no.	Module name	Credit points/semester							Work load	Course attendance time	Home study	Type of exam
		1	2	3	4	5	6	7				
BA 1-1	Representation, CAD Engineering computer science*	4	2						180	60 30	60 30	ST
BB 1-2	Building materials science 1	6							180	90	90	K2
BB 1-3	Building construction 2, Building physics 1	6							180	90	90	K2
BB 1-4	Technical mechanics, static, structural design	6							180	90	90	K2
BB 1-5	Mathematics 1, Natural sciences	8							240	90	150	K2
BB 2-1	Building construction, Building physics 2		6						180	75	105	ST
BB 2-2	Building materials science 2		6						180	90	90	K2
BB 2-3	Surveying		6						180	90	90	ST
BB 2-4	Technical mechanics, static, structural design 2		6						180	90	90	K2
BB 2-5	Mathematics 2, statistics		4						120	60	60	K2
BB 3-1	Structural engineering project			6					180	60	120	PA
BB 3-2	Traffic and water engineering*			3	3				180	45 45	45 45	K2
BB 3-3	Urban water management*			3	3				180	45 45	45 45	K2
BB 3-4	Technical mechanics, static, structural design 3			3					90	45	45	K2
BB 3-5	Basic principles of hydraulics			3					90	30	60	K1
BB 3-6	Geotechnics 1			6					180	90	90	K2
BB 3-7	Solid construction 1, Brickwork construction			6					180	90	90	K2
BB 4-1	Infrastructure project				6				180	60	120	PA
BB 4-4	Building operations 1				6				180	60	120	K2
BB 4-5	Basic principles of steel and wood engineering				6				180	90	90	K2
BB 4-6	Solid construction 2				6				180	60	120	K2
BB 5-1	Structural engineering or water engineering project**					6			180	60	120	PA
BB 5-2	Building operations 2					6			180	60	120	K2
BBV xx	*A total of three specialization modules, if a major is chosen, at least two from this area of specialization*					6			180	60	120	indiv.
BBV xx						6			180	60	120	indiv.
BBV xx						6			180	60	120	indiv.

Module no.	Module name	Credit points/semester							Work load	Course attendance time	Home study	Type of exam
BB 6-1	Practical training phase						30		750	10	740	ST
BBV 98	Practical training project***							6	180	3	177	ST
BB 7-1	Individual profile studies (HAWK plus)							6	180	60	120	indiv.
BB 7-3	Module for preparation of the final thesis							6	180	3	177	ST
BB 7-4	Bachelor's thesis							12	360	6	354	AA

* more than one semester

** For students majoring in Structural engineering or Water and Traffic engineering, the project BB 5-1 belonging to the specialization is obligatory. If majoring in Construction operations/construction management or not choosing a major, students must choose between the two topics offered in Project BB 5-1.

*** for the chosen major, can be replaced by another specialization module for this major (if available); if no major is chosen: freely selectable BBV-module

Compulsory elective modules/majors modules

Module no.	Module name	Credit points	Work load	Course attendance time	Home study	Type of exam Weighting
Majors modules in general						
BBV-06	Geotechnics 2	6	180	60	120	K2
BBV-07	Mudbrick building	6	180	60	120	ST
BBV-08	Building damages and redevelopment	6	180	60	120	R
BBv-09	Higher concrete technology	6	180	60	120	K2
BBV-98	Practical training project	6	180	3	177	ST
BBV-99	Special project	6	180	60	120	ST
Major: Structural engineering						
BBV-33	Special areas of solid construction and FEM	6	180	60	120	ST+K2 (50% each)
BBV-34	Prestressed concrete and prefabricated construction 1	6	180	60	120	K2
BBV-36	Basic Principles of bridge building	6	180	60	120	ST
BBV-37	Steel engineering	6	180	60	120	K2
BBV-38	Wood engineering	6	180	60	120	K2
Major: Water and traffic engineering						
BBV-62	Water management and water engineering	6	180	60	120	K2
BBV-63	Water engineering in actual practice	6	180	60	120	ST
BBV-64	Drinking water and wastewater networks	6	180	60	120	K2
BBV-66	Drinking water, wastewater, waste in developing countries	6	180	60	120	R
BBV-67	Streets and roadways	6	180	60	120	ST
BBV-68	Designing traffic facilities	6	180	60	120	ST

Module no.	Module name	Credit points	Work load	Course attendance time	Home study	Type of exam Weighting
BBV-69	Railroad construction	6	180	60	120	ST
BBV-70	Traffic engineering in actual practice	6	180	60	120	ST
BBV-71	Current topics from streets and roadways	6	180	60	120	ST+K1 (50% each)
Major: Building operations/building management						
BBV-81	Building operations 3	6	180	60	120	K2
BBV-82	Building supervision and site management	6	180	60	120	K1
BBV-83	Project management	6	180	60	120	ST
BBV-84	Safety and health protection during construction work	6	180	60	120	K2

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Descriptive geometry, CAD, Engineering computer science**	**BA 1-1**		21.07.2021
Study semester: 1st+2nd semester / Offered in WS: + SS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Martin Klaus	Type of teaching, group size, if applicable: Lecture, exercises and group exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Student research paper without colloquium -	Semester-spanning module; DesGeo and CAD in 1st semester; 1/3 DesGeo; 1/3 CAD; 1/3 Engineering computer science

Module objectives/desired learning outcomes:

Descriptive geometry and CAD
Students develop the ability to visualize three-dimensional solids, derive sectional figures, and digitize simple construction geometry using commercial software.
They are able to picture spatial objects and are able to make arbitrary sections of three-dimensional bodies. They have developed or improved ability to visualize spatially. They are able to produce simple floor plan, view and sectional drawings of building objects using Autocad software.

Engineering computer science
Students learn the basics of programming based on VBA and drawing design plans using commercial CAD software. They know how computers basically operate, the fundamentals of programming and are able to use the Excel spreadsheet program and add their own simple VBA scripts.
They have improved their analytical, structured way of thinking. They are able to create construction drawings using commercial CAD construction software.

Contents:

Descriptive geometry and CAD
- Descriptive techniques and descriptive geometry
- Projection techniques
- Design exercises using simple geometric figures
- Basic principles of using CAD
- Exercises in using CAD in the building industry

Engineering computer science
- How computers work
- Basic principles of programming
- Using spreadsheet programs, including the basics of VBA programming
- Using commercial software to create position and reinforcement plans

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. M. Klaus	2 LVS	Course attendance time		Home study	
Dipl.-Ing. Erika Puls, M.A.	6 LVS	Lecture	30 h	Course accompanying and exam preparation	90 h
Dipl.-Ing. Erika Puls, M.A.	3 LVS	Exercise	30 h		
Assistant lecturer	2 LVS	Other	30 h		
Total classroom time	**13 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Building materials science 1**	**BB 1-2**		17.12.2020
Study semester: 1st semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Iris Marquardt	Type of teaching, group size, if applicable: Lecture, practical lab training in groups		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Written examination (K2) -	

Module objectives/desired learning outcomes:

Students acquire basic knowledge of the properties of building materials and their behavior under different stresses. They learn the basic principles for the appropriate use of building materials with regard to load-bearing behavior and durability, as well as building physics requirements.
They acquire practical experience in the standard-compliant performance and evaluation of material tests on concrete constituents as well as on fresh and hardened concretes.
They are enabled to independently expand and update learned knowledge from the areas covered.

Contents:

1. Basic studies: Technical building regulations; systematics of building materials and building material properties; basics of material testing and quality assurance; microstructure and structure of building materials; mechanical behavior; behavior towards liquids and gases; thermal behavior; fire behavior

2. Mineral binding agents: Cement, plaster, lime, magnesia binder, clay

3. Raw materials for concrete production

4. Concrete: Classification of fresh and hardened concretes; test methods; mixtures for normal concretes; production, processing and quality assurance; strength and deformation behavior of normal concrete; durability; concretes for special requirements; mortars

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. Iris Marquardt	6 LVS	Course attendance time		Home study	
	-	Lecture	80 h	Course accompanying and exam preparation	90 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study		Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering		**Building construction, Building physics 1**	**BB1-3**		01.09.2018
Study semester	Offered in		Credit points		Semester week hours
1st semester	WS		6 CP		6 SWS
Allocation to study specialization		Responsible for module	Type of teaching, group size, if applicable		
-		N.N.	Lecture, exercise		
Can also be credited to study program			Language of instruction		
-			German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

Students acquire basic knowledge of the elements of load-bearing and non-load-bearing building structures and their modes of action and interdependencies in terms of building physics.
- They are able to recognize the structural, functional and design interrelationships and dependencies in execution and detail planning.
- They are able to apply design rules and put them into practice independently.
- Ability to recognize the structural and physical dependencies and to design and verify solutions for the serviceability of components and buildings.

Contents:

Basic principles of Building design 1:
Structural stability, load-bearing elements and load-bearing systems
Shell constructions such as foundation/earthwork, masonry, waterproofing, concrete construction, timber construction, timber panel construction, timber frame construction, wood protection, sloping roofs, flat roofs, steel construction, facade, windows, thermal insulation composite systems; finishing constructions such as drywall construction, floor ceilings, floors, doors, stairs, staircases, elevators

Basic principles of Building physics 1:
Basic principles of heat and moisture transport, contents of DIN 4108 thermal insulation such as minimum thermal insulation, climate-related moisture protection Processes and verification

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Matthias Pätzold	5 LVS	Course attendance time		Home study	
Assistant lecturer	1 LVS	Lecture	60 h	Course accompanying and exam preparation	90 h
	-	Exercise	30 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Technical mechanics, Static, Structural design 1**	**BB 1-4**		01.09.2018
Study semester: 1st semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Stefanie Steppeler	Type of teaching, group size, if applicable: Lecture with integrated exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

Students
- are confident in their use of relevant quantities and terms of engineering mechanics.
- master the basic principles and methods of statics of statically determinate plane systems.
- are able to model load-bearing systems for simple structures.
- learn to calculate support reactions and internal forces of statically determinate plane systems and to represent the state lines.

Contents:

- Forces, momentum and force systems
- Equilibrium and equivalence
- Basic principles of the safety concept (actions and resistances)
- Stability of rigid bodies
- Basic terminology used in structural engineering, types of structures and their application
- Model building
- Method of sections, shear diagram
- Support reactions and internal forces of statically determinate plane systems
- Load case superposition

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. S. Steppeler	6 LVS	Course attendance time		Home study	
	-	Lecture	75 h	Course accompanying and exam preparation	90 h
	-	Exercise	15 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Tutorial

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Mathematics 1 and Natural sciences**	**BB 1-5**		04.07.2019
Study semester: 1st semester / Offered in: WS		Credit points: 8 CP		Semester week hours: 6 SWS
Allocation to study specialization: -	Responsible for module: Prof. Dr.-Ing. Axel Stödter	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	2/3 mathematics, 1/3 natural sciences

Module objectives/desired learning outcomes:

- Students master mathematical techniques, procedures and algorithms as a prerequisite for solving problems in the field of civil engineering.

- Students acquire the structured exact thinking and working methods of mathematics as one of the skills of engineers.

- They are confident in the application of basic knowledge from the natural sciences of physics, chemistry and biology as a prerequisite for solving interdisciplinary engineering problems.

Contents:

- Determinants and matrices, equation systems
- Vector concept, vector operations, vector algebra
- Functions, types of functions, properties of functions, limits
- Differential calculus with applications in geometry and technology

- Physical unit systems
- Basic principles of thermal dynamics
- Electricity
- Atomic structure, bond types
- Stoichiometric calculations
- Acid-base equilibria, redox reactions
- Classification and growth of (micro) organisms
- Biochemical metabolism

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. A. Stödter	2 LVS	Course attendance time		Home study	
Prof. Dr. G. Bahre	2 LVS	Lecture	90 h	Course accompanying and exam preparation	150 h
Assistant lecturer	2 LVS	Exercise			
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**240 h**

Optional extra

Tutorial

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Building construction, Building physics 2**	**BB 2-1**		22.02.2019
Study semester: 2nd semester / Offered in: SS		Credit points: 6 CP		Semester week hours: 5 SWS
Allocation to study specialization: -	Responsible for module: Prof. Dr.-Ing. Peter Leimer	Type of teaching, group size, if applicable: Lecture with integrated exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types: Student research paper without colloquium -	If applicable, weighting of the study/examination achievements

Module objectives/desired learning outcomes:

- Students acquire basic knowledge of designing, planning, working through and drawing a construction project.

- They are able to recognize the structural, design, functional, economic and energy requirements of construction in the overall context using the example of a construction task.

- They are enabled to develop their own learning strategies and conduct independent research.

Contents:

Basic principles of planning:
Basic drafting, building regulations code, calculation of area and space

Building construction 2:
Basic principles of drafting and designing
Development of a planning concept for a building under structural and physical boundary conditions

Building physics 2
Energy and environment, basic principles of energy-saving thermal insulation according to EnEV. Basic principles of acoustics, sound propagation and sound insulation
Basic principles of fire safety

Calculations with building physics computer programs (in groups) to prove energy-saving construction and soundproofing

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. P. Leimer	4 LVS	Course attendance time		Home study	
Assistant lecturer	4 LVS	Lecture	60 h	Course accompanying and exam preparation	105 h
	-	Exercise	15 h		
	-	Other			
Total classroom time	**8 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Building materials science 2**	**BB 2-2**		17.12.2020
Study semester: 2nd semester / Offered in: SS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Iris Marquardt	Type of teaching, group size, if applicable: Lecture, practical lab training in groups		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Building materials science 1 (BB1-2)
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

Students learn the basic principles for the use of metallic, inorganic and organic building materials with regard to load-bearing behavior and durability as well as building physics requirements.
They acquire practical experience in standard-compliant performance and evaluation of material tests on metal, bitumen and asphalt as well as wood and wood-based materials.
They are enabled to independently expand and update learned knowledge from the areas covered.

Contents:

1. Metallic building materials: Basic principles of metallurgy, steel and cast iron, structural steels, reinforcing steels, prestressing steels, welding, non-ferrous metals, corrosion and corrosion protection of construction metals
2. Wood and wood-based materials
3. Bitumen and asphalt
4. Synthetic materials in the building industry
5. Natural and artificial stones: Composition, properties, areas of application
6. Masonry/brickwork
7. Building glass

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. Iris Marquardt	6 LVS	Course attendance time		Home study	
	-	Lecture	80 h	Course accompanying and exam preparation	90 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study		Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering		**Surveying**	**BB 2-3**		01.09.2018
Study semester	Offered in		Credit points		Semester week hours
2nd semester	SS		6 CP		6 SWS
Allocation to study specialization		Responsible for module	Type of teaching, group size, if applicable		
-		Prof. Dr.-Ing. Axel Stödter	Lectures with practical exercises		
Can also be credited to study program			Language of instruction		
Bachelor of Wood Engineering			German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Student research paper without colloquium -	

Module objectives/desired learning outcomes:

Students will independently apply appropriate procedures to the methods listed below using concrete and practical examples and compile or map and draw evaluations of professional practice. They should be able to estimate required accuracies and increase them, if necessary. They are to acquire practical knowledge with special reference to the project study in the field of planning and construction as well as for inventories for redevelopment objects.

Contents:

- Basic principles of surveying
- Building survey
- Staking out buildings
- Leveling
- Recording the profile
- Determining area and mass
- Trigonometry, introduction to tachymetry, traverse line, tachymetric survey
- Routing elements for road construction, etc.

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. Axel Stödter	6 LVS	Course attendance time		Home study	
Dipl.-Ing. S. Wethkamp	4 LVS	Lecture	30 h	Course accompanying and exam preparation	90 h
	-	Exercise	60 h		
	-	Other			
Total classroom time	**10 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Technical mechanics, Static, Structural design 2**	**BB 2-4**		01.09.2018
Study semester: 2nd semester / Offered in: SS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Stefanie Steppeler	Type of teaching, group size, if applicable: Lecture with integrated exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	BB 1-4
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

Students
- learn to calculate support reactions and internal forces of statically determinate plane systems and to represent the state lines.
- acquire skills for determining the internal stress of parts of the structure.
- learn how to determine stresses due to normal force, shear force, bending and torsion.
- acquire the prerequisites for the material-dependent design and dimensioning of load-bearing structures and structural parts.

Contents:

- Support reactions and internal forces of statically determinate plane structures
- Stresses, strain, sliding, material laws
- Cross-section values
- Normal stresses due to normal force and bending
- Shear stresses due to shear force and torsion
- Normal stresses with failure in the tensile zone
- Stress states, principal stresses and strength hypotheses

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. S. Steppeler	6 LVS	Course attendance time		Home study	
	-	Lecture	75 h	Course accompanying and exam preparation	90 h
	-	Exercise	15 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Tutorial

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Mathematics 2 with statistics**	**BB 2-5**		04.07.2019
Study semester: 2nd semester / Offered in: SS		Credit points: 4 CP		Semester week hours: 4 SWS
Allocation to study specialization: -	Responsible for module: Prof. Dr.-Ing. Axel Stödter	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Written examination (K2) -	

Module objectives/desired learning outcomes:

- Students master mathematical techniques, procedures and algorithms as a prerequisite for solving problems in the field of civil engineering.
- Students acquire the structured exact thinking and working methods of mathematics as one of the skills of engineers.

Contents:

- Differential calculus with applications in geometry and technology (continued)
- Ordinary and partial differential equations (introduction)
- Integral calculus with applications in geometry and technology
- Sequences and series
- Probability calculation and statistics

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. A. Stödter	2 LVS	Course attendance time		Home study	
N.N.	2 LVS	Lecture	60 h	Course accompanying and exam preparation	60 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**120 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Project in Structural civil engineering**	**BB 3-1**		21.06.2021
Study semester: 3rd semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Martin Klaus	Type of teaching, group size, if applicable: Project work with supervision in groups		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Statics 1 (BB 1-2); Statics 2 (BB 2-4); parallel: Solid construction 1, Brickwork construction
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Project work with colloquium -	

Module objectives/desired learning outcomes:

Whereas in other modules individual building components are usually considered independently of each other, in this module a simple complete building is analyzed.
The students are familiar with the load assumptions for buildings in structural engineering and can set up a structured static calculation for a structurally simple building.
Students understand load transfer in a simple building. They are able to develop the static system for individual components and calculate it, taking into account the boundary conditions. They are able to independently create simple position plans and reinforcement drawings based on their calculation results.
Within a project group, they develop their own team, conflict, facilitation and leadership skills. They are able to conduct simple literature research and, to a lesser extent, to expand their knowledge independently.

Contents:

- Meetings in project teams
- Drawings in structural civil engineering
- Planning process in building construction
- Structure of static calculations
- Load assumptions in building construction
- Breaking down a complete building into its parts
- Basic principles of static-constructive drafting, including pre-dimensioning of simple building parts
- Finding load-bearing systems, including best choice of building materials (concrete construction/masonry construction)
- Basic principles of building bracing
- Thoughts on economic efficiency
- Position plans/reinforcement drawings

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. Martin Klaus	4 LVS	Course attendance time		Home study	
N.N.	2 LVS	Lecture	15 h	Course accompanying and exam preparation	120 h
Iannis Kramer, B.Eng.	2 LVS	Exercise	45 h		
	-	Other			
Total classroom time	**8 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Traffic and water engineering**	**BB 3-2**		01.09.2018
Study semester: 3rd + 4th semester / Offered in WS: + SS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: -	Responsible for module: Prof. Dr.-Ing. Axel Stödter	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Written examination (K2) -	Traffic engineering (50%) Water engineering (50%)

Module objectives/desired learning outcomes:

- Basic knowledge of urban planning contexts
- Knowledge of the theoretical development of traffic concepts
- Skills in the presentation and analysis of basic urban planning and traffic concepts
- Knowledge of the integrative structure of traffic planning
- Ability to develop the design of the road space
- Basic knowledge of the development of authoritative principles in hydraulic engineering
- Basic understanding of viewpoints on water management planning
- Knowledge of the basic elements of hydraulic engineering

Contents:

In the winter semester:
- Urban and traffic history, basic concepts and planning law
- Planning principles, organizational forms and regulations
- Urban and traffic models, basic principles of draft and design
- Current condition survey, planning and design of traffic types

In the summer semester:
- History of water engineering and water management
- River engineering and river structures
- Applications in hydraulics
- Hydrometry

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. A. Stödter	3 LVS	Course attendance time		Home study	
Dipl.-Ing. Anja Markwart	3 LVS	Lecture	90 h	Course accompanying and exam preparation	90 h
	-	Exercise			
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Urban water management**	**BB 3-3**		30.07.2021

Study semester	Offered in WS	Credit points	Semester week hours
3rd + 4th semester	+ SS	6 CP	6 SWS

Allocation to study specialization	Responsible for module	Type of teaching, group size, if applicable
All	Prof. Dr.-Ing. Günther Bahre	Lecture with exercises
Can also be credited to study program		Language of instruction
-		German

Requirements according to examination regulations	Recommended prerequisites
	Successful completion of module BB 1-5
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

- Knowledge of drainage systems
- Identification and solving of stormwater treatment and drainage problems
- Getting to know parameters for stress assessment
- Expansion of basic scientific knowledge for use in urban water management
- Learning about procedural basics of treatment technology
- Development of dimensioning bases and application of dimensioning techniques for use in drinking water and wastewater treatment
- Recognition and assessment of areas of application and application limits of the treatment processes used, development of target-oriented process chains

Contents:

Part I (in the winter semester)

- Drainage systems
- Rainwater treatment
- Basic physical, chemical, and biological principles and processes of water, wastewater, and waste treatment
- Precipitation/flocculation, filtration, bacterial count reduction
- Mechanical processes (rake, grit trap, primary

treatment) Part II (in the summer semester)

- Processes for biological / chemical wastewater treatment (incl. elimination of nitrogen and phosphorus)
- Process for the treatment of residual materials produced in a sewage treatment plant, sludge treatment in particular
- Dimensioning of the above mentioned processes and procedural steps

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. G. Bahre	6 LVS	Course attendance time		Home study	
	-	Lecture	85 h	Course accompanying and exam preparation	90 h
	-	Exercise	5 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Exercise units, tutorial, practical lab training

Literature

is listed in Stud.IP

Allocation to course of study		Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering		**Technical mechanics, Static 3, Structural engineering 3**	**BB 3-4**		31.05.2021
Study semester: 3rd semester	Offered in: WS		Credit points: 3 CP		Semester week hours: 3 SWS
Allocation to study specialization: All		Responsible for module: Prof. Dr.-Ing. Michael Hansen	Type of teaching, group size, if applicable: Lecture with integrated exercises		
Can also be credited to study program: -			Language of instruction: German		
Requirements according to examination regulations		Recommended prerequisites: BB 1-4, BB 2-4			
Study/examination achievements/ examination types: Written examination (K2) -		If applicable, weighting of the study/examination achievements			

Module objectives/desired learning outcomes:

Students are able to predict the deformation behavior of structures and determine deformation quantities correctly in terms of quality. They are able to determine the internal forces in statically indeterminate beam structures as a result of load and constraint actions. In addition, they are able to assess the influence of deformations on the load-bearing behavior and have basic knowledge in the analysis of the structural behavior in the case of locally variable actions.

Contents:

- Kinematics
- Individual deformations and bending lines
- Determination of support reactions and internal forces of statically indeterminate plane systems with the force magnitude method
- Basic principles of the stability theory
- Basic principles of determining influence lines

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. habil. M. Hansen	3 LVS	Course attendance time		Home study	
	-	Lecture	25 h	Course accompanying and exam preparation	45 h
	-	Exercise	20 h		
	-	Other			
Total classroom time	**3 LVS**	**Total workload**			**90 h**

Optional extra

Tutorial

Literature

is listed in Stud.IP

Allocation to course of study		Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering		**Basic principles of hydraulics**	**BB 3-5**		01.09.2018
Study semester: 3rd semester	Offered in: WS		Credit points: 3 CP		Semester week hours: 2 SWS
Allocation to study specialization: -		Responsible for module: Prof. Dr.-Ing. Axel Stödter	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -			Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Written examination (K1) -	

Module objectives/desired learning outcomes:

- Students acquire basic knowledge of hydromechanics (hydrostatics with buoyancy, groundwater hydraulics, pipe and channel hydraulics).
- They are able to solve basic problems in the fields of hydrostatics, hydrodynamics with pipe hydraulics, and flow hydraulics.

Contents:

- Determining water pressure, buoyancy, swimming stability
- Groundwater
- Water movement in pipes
- Water movement in channels at weirs and constrictions, outflow from openings

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. A. Stödter	2 LVS	Course attendance time		Home study	
	-	Lecture	30 h	Course accompanying and exam preparation	60 h
	-	Exercise			
	-	Other			
Total classroom time	**2 LVS**	**Total workload**			**90 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Geotechnics 1**	**BB 3-6**		01.11.2018
Study semester: 3rd semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Georg Maybaum	Type of teaching, group size, if applicable: Lecture with exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Written examination (K2) -	

Module objectives/desired learning outcomes:

- Basic knowledge in the recognition and for the classification of soils
- Basic knowledge of soil investigation and field and laboratory determination of important soil mechanical properties
- Ability to estimate the load-bearing behavior of soils and the effect of the subsoil in relation to structures
- Ability to design shallow foundations
- Knowledge of retaining structures (underpinning, bank protection, retaining walls, etc.)
- Knowledge on how to build excavation pits

Contents:

Formation of soils and methods of soil investigation
- Classification of soils according to different categories, load-bearing behavior of the foundation soil
- Relevant soil mechanical properties and methods for their determination
- Flat and area foundations, their load-bearing behavior and calculation
- Introduction to the earth pressure theory, load determination (water and earth pressure)
- Method of securing the excavation pit and its calculation
- Procedure for calculating stress and settlement

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. G. Maybaum	6 LVS	Course attendance time		Home study	
	-	Lecture	60 h	Course accompanying and exam preparation	90 h
	-	Exercise	30 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Solid construction 1, Brickwork/masonry construction**	**BB 3-7**		31.05.2021
Study semester: 3rd semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Michael Hansen	Type of teaching, group size, if applicable: Lecture with exercise		
Can also be credited to study program: -		Language of instruction: German		
Requirements according to examination regulations		Recommended prerequisites: BB 1-4, BB 2-4, BB 1-2, BB 2-2		
Study/examination achievements/ examination types: Written examination (K2) -		If applicable, weighting of the study/examination achievements		

Module objectives/desired learning outcomes:

Basic principles of cross-section dimensioning and design under normal force, bending force and shear force loads

Students know the basic principles of reinforced concrete design in uncracked and cracked conditions. They are able to perform a cross-section design under normal force and bending stress and to determine longitudinal bending reinforcement on the basis of this. In addition, they understand the load-bearing mechanisms in reinforced concrete construction and can also calculate the reinforcement resulting from shear force loading. Students know how to arrange the determined reinforcement and are able to sketch it.

What's more, they know how to design masonry structures and how to execute them correctly from a structural and design point of view.

Contents:

• Reinforced concrete construction:
- Introduction to the safety concept and to the basics of reinforced concrete construction
- Basic principles of bending and shear force design of reinforced concrete components
- Dimensioning and construction of standard structural elements (beams, uniaxially spanned ceilings, ...)
- Design rules and basics of reinforcement design

• Masonry/brickwork:
Design of masonry structures under normal force, bending and shear loads

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. habil. M. Hansen	6 LVS	Course attendance time		Home study	
	-	Lecture	45 h	Course accompanying and exam preparation	90 h
	-	Exercise	45 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Tutorial

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Infrastructure project**	**BB 4-1**		04.08.2018
Study semester: 4th semester / Offered in: SS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: -	Responsible for module: N.N.	Type of teaching, group size, if applicable: Project work with supervision in groups		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Participation in module BB 3-2 Traffic and water engineering
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Project work with colloquium -	

Module objectives/desired learning outcomes:

- System-compatible application of knowledge of urban and traffic planning
- Ability to define a goal and the strategic planning process
- Ability to manage groups and present results
- Ability to determine the basis and develop variants
- Ability to engage in technical discussion, evaluation of planning alternatives, and decision-making for the development of urban and transportation concepts appropriate to the site
- Ability to draft concepts in text and drawings

Contents:

- Target framework and failure analysis
- Inventory taking
- Deriving general measures
- Site-specific measures with impact analysis
- Public relations concepts
- Development of computer-aided planning and design documents

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
N.N.	4 LVS	Course attendance time		Home study	
Dipl.-Ing. Anja Markwart	2 LVS	Lecture	30 h	Course accompanying and exam preparation	120 h
	-	Exercise	30 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Building operations 1**	**BB 4-4**		25.01.2019
Study semester: 4th semester / Offered in: SS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: -	Responsible for module: Prof. Dr.-Ing. Mario Hanusrichter	Type of teaching, group size, if applicable: Lecture, exercise		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Written examination (K2) -	

Module objectives/desired learning outcomes:

Basic features of the construction market:
The course is designed to provide an overview of the special features of the construction (and real estate) market. Students acquire basic knowledge of the dimension of the market, its economic significance and the forms of project management. The market participants are presented in their various functions; how these functions interact for the construction and real estate market is made clear. In addition, the course is intended to provide students with a crucial starting point for an orientation in a subsequent specialization and/or Master's module, if applicable.

Construction industry 1:
Students gain knowledge of the essential aspects of the construction industry. The focus here is on determining the costs of construction services. Students are to understand selected aspects of construction contract law and quality management as well as the functioning of a construction company. The knowledge acquired in the lectures is applied in a practical manner in the form of exercises.

Contents:

Basic features of the construction market:
- The national, European and international construction market; the roles of construction stakeholders
- Models of project execution; performance profiles of typical engineer and architects' activities
- Cost elements of construction; financing of construction and infrastructure projects (PPP)
- Freelance activities; project structuring and rough scheduling

Construction industry 1 (lecture):
- Special features of construction production; structural and process organization
- Basic principles of tendering, awarding and accounting (VOB/A, HVA B-StB, VHB); wages and salaries; working time values
- Calculation methodology; determination of surcharges; allocation procedure; determination of prices (costing)
- the construction contract and General Contractual Conditions for the Execution of Construction Work (VOB/B)
- Basic principles of quality management

in the construction industry I (exercise):
- Calculating labor and equipment costs
- Determining unit prices

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. M. Hanusrichter	4 LVS	Course attendance time		Home study	
	-	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Basic principles of steel and wood engineering**	**BB 4-5**		01.09.2018
Study semester: 4th semester / Offered in: SS		Credit points: 6 CP		Semester week hours: 6 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Volker Krämer	Type of teaching, group size, if applicable: Lecture with integrated exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	BB 1-2, BB 1-4, BB 2-4
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	50% Wood engineering - 50% Steel engineering

Module objectives/desired learning outcomes:

Students (Steel engineering)
- know the most important material properties of steel.
- are able to apply the European safety concept in relation to steel construction-specific safety.
- are able to apply the basic European dimensioning standards in steel construction.
- are proficient in the standard-compliant verification of the structural safety and serviceability of simple tension and compression members and of bending girders in steel structures.
- are able to design and dimension simple structural steel connections in accordance with standards.

Students (Wood engineering)
- are able to independently design components of simple timber structures in building construction and dimension them in accordance with standards.
- learn to connect the components to each other in a force-fit manner using pin-shaped, metallic fasteners.
- are enabled to apply timber construction-specific solution concepts for simple timber construction projects and to transfer these solution concepts independently to other planning tasks in timber construction.

Contents:

Steel engineering:
- Steel and steel products, material properties
- Safety concept with regard to steel structure-specific safety features
- Introduction to the European dimensioning standards in steel construction
- Basic principles of dimensioning and design of simple tension and compression members as well as bending girders
- Basic principles of dimensioning and design of simple bolted and welded joints

Wood engineering:
- History, built objects, wood technology
- Basic principles for the dimensioning of structural components made of wood and wood-based materials (e.g. beams, supports)
- Verification of the stability of buckling bars and bending beams made of wood and wood-based materials that are at risk of tilting
- Basic principles for the dimensioning of pin-shaped fasteners (e.g. bar dowels, nails)
- Basic principles for the design and dimensioning of simple load-bearing structures made of wood

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. V. Krämer	3 LVS	Course attendance time		Home study	
Prof. Dr.-Ing. S. Steppeler	3 LVS	Lecture	90 h	Course accompanying and exam preparation	90 h
Iannis Kramer, B. Eng.	-	Exercise			
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Exercise in steel engineering (scope: 1 LVS)

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Solid construction 2**	**BB 4-6**		31.05.2021
Study semester: 4th semester / Offered in: SS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Michael Hansen	Type of teaching, group size, if applicable: Lecture with integrated exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	BB 3-7
Study/examination achievements/ examination types: Written examination (K2) -	**If applicable, weighting of the study/examination achievements**

Module objectives/desired learning outcomes:

Basic principles of calculation and structurally correct execution of the main reinforced concrete components of usual building construction

Students are able to design and reinforce beam structures, floor slabs with different support conditions and foundation components. They are able to determine the internal forces of shell structures, evaluate the punching shear resistance and ensure this by appropriate reinforcement design. In addition, they are also able to size, dimension and design pressure members that are at risk of stability. Students will also have a basic knowledge of crack width limitation of reinforced concrete members.

Contents:

- Multi-axis tensioned, line-bearing panels
- Point-supported panels
- Foundation components, especially centrically and eccentrically loaded foundations
- Slim supports
- Verification of serviceability limit state design (crack width limitation, part 1)
- Special features such as joists in the same floor, slabs under special loads, slabs with openings, stairs
- Extended construction and reinforcement rules for the components covered

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.- Ing. habil. M. Hansen	4 LVS	Course attendance time		Home study	
	-	Lecture	30 h	Course accompanying and exam preparation	120 h
	-	Exercise	30 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Project in Structural civil engineering**	**BB 5-1**		21.06.2021
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Structural civil engineering	Responsible for module: Prof. Dr.-Ing. Martin Klaus	Type of teaching, group size, if applicable: Project work with supervision in groups		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Project in 3rd semester (BB 3-1);BB 3-4; BB 4-6;BB 4-5;BBV-33;BBV-37
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Project work with colloquium -	

Module objectives/desired learning outcomes:

Students are trained in the design and calculation of structural frameworks for building construction on the basis of a project task. The main focus is on the independent processing of a structural design with explanation/justification. The application of previously learned expertise from various disciplines (across construction types) is combined within the overall task.
The calculation of the fee for engineering services of the structural engineer in building construction according to HOAI

Students deepen their understanding of load transfer in both vertical and horizontal directions in a building. They are able to develop and calculate different structural solutions for a building based on the usage requirements. They are able to independently create position plans and reinforcement drawings based on their calculation results.

Within a project group, they develop their own team, conflict, facilitation and leadership skills. They are able to conduct literature research and to expand their knowledge independently and then to present their findings.

Contents:

- Meetings in project teams
- Design of a building from a structural point of view in solid and/or steel construction
- Calculation of the fee for the structural engineer according to HOAI
- Static-structural drafting, including pre-dimensioning of simple building parts
- Development of structural variants (concrete construction/masonry construction/steel construction)
- Breakdown of a complete building into components taking into account the vertical and horizontal load transfer
- Creation of a verifiable static calculation
- Simple geotechnical verifications for the foundation components
- More detailed proofs for building bracing
- Preparation of construction drawings in solid and steel construction (ready for execution according to HOAI)

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. M. Klaus	4 LVS	Course attendance time		Home study	
N.N.	2 LVS	Lecture	15 h	Course accompanying and exam preparation	120 h
Iannis Kramer, B.Eng.	2 LVS	Exercise	45 h		
	-	Other			
Total classroom time	**8 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Advanced project in water engineering**	**BB 5-1**		01.09.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Water and traffic engineering	Responsible for module: Prof. Dr.-Ing. Günther Bahre	Type of teaching, group size, if applicable: Project work with supervision in groups		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Good knowledge of CAD
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Project work with colloquium -	

Module objectives/desired learning outcomes:

- Application-oriented knowledge of water law
- Methodical knowledge of planning and approval procedures
- Moderation of the process flow
- Ability to prepare a draft permit under the water law

Contents:

- Water law, emission law, administrative procedures
- Simulation game for the preparation of a water law approval procedure
- Preparation of a draft permit for the reconstruction and extension of a sewage treatment plant with the elements
  - Explanatory report
  - Technical calculations
  - Drawings (site plan, floor plans, sections, hydraulic longitudinal section, P&I flow diagram) Group work

Regular attendance is required as part of the weekly project work.

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. G. Bahre	6 LVS	Course attendance time		Home study	
	-	Lecture	10 h	Course accompanying and exam preparation	120 h
	-	Exercise	50 h		
	-	Other			
Total classroom time	**6 LVS**	**Total workload**			**180 h**

Optional extra

Project-accompanying supervision, tutorial

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Building operations 2**	**BB 5-2**		25.01.2019
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: -	Responsible for module: Prof. Dr. Ing. Mario Hanusrichter	Type of teaching, group size, if applicable: Lecture, exercise		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types Written examination (K2) -	**If applicable, weighting of the study/examination achievements**

Module objectives/desired learning outcomes:

Building technology 1:
Students gain knowledge of the essential aspects of work preparation, including job scheduling and construction process technology. They are enabled to determine the general facilities and machinery and equipment required for a construction project and to determine their performance.
The knowledge acquired in the lectures is applied in a practical manner in the form of exercises.

Construction law 1 (Construction contract law):
Students are taught the basic principles of construction contract law necessary to understand the construction process.

Contents:

Building technology 1 (lecture):
- Work preparation; basic principles of construction methods and processes; general site organization
- Assessment of the performance of construction machines; machine-technical basics, capacity planning
- Basic principles of occupational health and safety
- Equipment and methods of earthwork and foundation construction; lifting equipment; formwork; logistics of concrete and masonry construction Building technology I (exercise):
- Site equipment planning; performance determination in earthworks; formwork concrete construction
- Development of schedules (using different methods)

Construction Law 1 (fundamentals of construction contract law):
- Conclusion of the construction contract
- Construction contract as VOB or BGB contract
- General terms and conditions
- Warranty according to VOB/B and BGB, liability issues, concerns, obstruction, termination
- Overview of VOB Part C with regard to the systematics of general technical contract conditions

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. M. Hanusrichter	2 LVS	Course attendance time		Home study	
Hon.-Prof. A. Biedermann (Building technology 1)	2 LVS	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Practical training phase**	**BB 6-1**		01.09.2018
Study semester: 6th semester / Offered in WS: + SS		Credit points: 30 CP		Semester week hours: n/a
Allocation to study specialization: All	Responsible for module: Prof. Dr. Ing. Mario Hanusrichter	Type of teaching, group size, if applicable: Pre- and post-seminar, practical phase		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
All CP from semesters 1+2, a further 45 CP from semesters 3 to 5	
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Seminar paper Student research paper without colloquium	15 weeks of practical training (translates as 24 CP), pass / fail StA (report) and seminar paper (translates as 6 CP) will be graded

Module objectives/desired learning outcomes:

- Application of previously acquired knowledge and skills in everyday professional practice, engineering work
- Gain competencies in an area that the student has designated for future employment
- Working in the training center is designed to give students some orientation for finding a topic for their Bachelor's thesis
- Stimulation to link non-specialist content with the student's own training to date
- Development of independent decision-making ability
- Presentation of the professional and social competence acquired during the course of study.

Contents:

Practical phase supervised by the Civil Engineering program of the Faculty of Architecture, Construction and Conservation in a company (training facility) of the construction trade/industry, in an engineering or architectural office, in a professional authority, in a professional association, or comparable
The company/institution must ensure that engineering supervision is possible during the practical phase, i.e. at least 1 engineer must provide supervision in the company / office / in the public authority / in the association (i.e. training facility).
The regulations for the practical phase according to the Praxisphasenordnung (PraxisO) must be observed.

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
entire teaching staff, per student	0.1 LVS	Course attendance time		Home study	
	-	Lecture		Course accompanying and exam preparation	740 h
	-	Exercise			
	-	Other	10 h		
Total classroom time	**0.1 LVS**	**Total workload**			**750 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Individual profile studies**	**BB 7-1**		01.09.2018
Study semester: 7th semester / Offered in WS: + SS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: All	Responsible for module: HAWK plus	Type of teaching, group size, if applicable: Course-dependent, according to information from HAWK plus		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Course-dependent -	

Module objectives/desired learning outcomes:

Areas of competence of the Individual Profile Studies (IPS)
- Thinking and acting like an entrepreneur
- Leadership skills
- Communication and individual skills
- Social and societal skills
- Media skills
- Interdisciplinary specialized knowledge
- Language competence

Contents:

See the IPS Module Handbook for the current range of courses (https://www.hawk.de/de/hochschule/organisation-und-personen/zentrale-einrichtungen/hawk-plus/individuelles-profilstudium)

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
up to 4 LVS		Course attendance time		Home study	
	-	Lecture		Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other	60 h		
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Module for preparation of the final thesis**	**BB 7-3**		01.09.2018
Study semester: 7th semester / Offered in WS: + SS		Credit points: 6 CP		Semester week hours: n/a
Allocation to study specialization: All	Responsible for module: N.N.	Type of teaching, group size, if applicable: Supervised exercise		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types: Student research paper without colloquium -	If applicable, weighting of the study/examination achievements

Module objectives/desired learning outcomes:

- Knowledge and skills in the application of the methods of academic work and writing
- Gain knowledge and skills in a field that the student has designated for his/her Bachelor's thesis
- Ability to grasp and present the state of the art in a given subject area
- Development of independent decision-making ability
- Presentation of acquired expertise in a given subject area

Contents:

- Students conduct comprehensive literature searches covering not only monographs, but also journals and other series
- Prepare and test experimental setups, test procedures or similar
- Participation in seminars on methods used in academic work and writing (participation possible as early as 2nd semester)

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
entire teaching staff, per student	0.2 LVS	Course attendance time		Home study	
	-	Lecture		Course accompanying and exam preparation	177 h
	-	Exercise			
	-	Other	3 h		
Total classroom time	**0.2 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Final Bachelor's thesis**	**BB 7-4**		01.09.2018
Study semester: 7th semester / Offered in WS: + SS		Credit points: 12 CP		Semester week hours: n/a
Allocation to study specialization: All	Responsible for module: N.N.	Type of teaching, group size, if applicable: n/a		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
174 CP from semesters 1 to 6	
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Final thesis with colloquium -	

Module objectives/desired learning outcomes:

- Ability to grasp and present the state of the art in a given subject area
- Develop and demonstrate independent decision-making skills
- Presentation of the acquired methodological competence
- Presentation of total expertise acquired in a given subject area

Contents:

For example:
Conducting comprehensive literature research with classification and evaluation, and/or
Carrying out practical investigations, test procedures or similar with evaluation, discussion and the student's own conclusions
and/or
Performing technical calculations with factual/technical appropriate presentation, and/or
Developing drafts from a given subject area in the field of civil engineering

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
First examiner	0.3 LVS	Course attendance time		Home study	
Second examiner	0.1 LVS	Lecture		Course accompanying and exam preparation	354 h
	-	Exercise			
	-	Other	6		
Total classroom time	**0.4 LVS**	**Total workload**			**360 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Geotechnics 2**	**BBV 06**		03.12.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Georg Maybaum	Type of teaching, group size, if applicable: Lecture with exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Written examination (K2) -	

Module objectives/desired learning outcomes:

Knowledge
- about special soil mechanics laboratory tests,
- on the preparation of geotechnical expert opinions,
- on procedures for securing excavations to maintain water pressure,
- on water retention and its calculation,
- on subsoil behavior under external influences and the corresponding calculations,
- on methods of subsoil improvement;
- Assessment of the quality and informative value of existing information sources and documentation

Contents:

Explanation of more complex laboratory tests;
Communication of in-depth knowledge on special procedures in geotechnical engineering; calculation procedures for stability and serviceability verifications; information on the practical preparation of expert reports

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. G. Maybaum	4 LVS	Course attendance time		Home study	
	-	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Mudbrick / clay building**	**BBV 07**		03.12.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Georg Maybaum	Type of teaching, group size, if applicable: Seminar		
Can also be credited to study program: Bachelor of Wood Engineering		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Student research paper with colloquium -	

Module objectives/desired learning outcomes:

Students
- understand mudbrick as a building material of the past, present and, in view of its renaissance in the 21st century, also as a building material of the future.

- are familiar with the design options that mudbrick offers as a building material.
- deal with its material properties as well as with traditional and modern construction methods and the state of the art of rehabilitation techniques within the framework of the basic theoretical principles.
- know about the connection to the Lehm e.V. network, which HAWK was involved in founding in 2008, the problems of production processes in the manufacture of mudbrick building products, the craftsmanship involved in the use of semi-finished mud products and, last but not least, the state of the art in research.
- gain valuable experience for quality assurance during their own practical exercises in the laboratory and valuable experience on site for tendering and construction management tasks.

Contents:

- History of mudbrick building
- Cultural heritage and world cultural heritage
- The building material and its characteristics
- Building methods such as adobe construction, Weller construction, rammed earth construction, half-timbered construction with compartments filled with clay/mud etc.
- Design options from yesterday, for today and for tomorrow
- Building improvement technologies
- Visits to construction sites, if applicable

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. G. Maybaum	4 LVS	Course attendance time		Home study	
	-	Lecture	60 h	Course accompanying and exam preparation	90 h
	-	Exercise	30 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Practical exercises in the lab with the goal of quality assurance

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Building damages and redevelopment**	**BBV 08**		15.04.2020
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Iris Marquardt	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Seminar paper -	

Module objectives/desired learning outcomes:

In-depth knowledge of the cause, recording and analysis of damage to masonry, reinforced and prestressed concrete components and structures
Knowledge and application of examination and measurement methods for building materials

and structural damage

In-depth knowledge of the repair of existing building components

Contents:

Basic principles
Causes of damage to structural elements/structures made of masonry, natural stone as well as reinforced and prestressed concrete Inventory and damage diagnosis
Examination and measurement methods for building materials
and structural damage Redevelopment construction materials
Methods for repair, restoration
of masonry, restoration of
concrete structures, restoration
of fire damage

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. Iris Marquardt	4 LVS	Course attendance time		Home study	
	-	Lecture	60 h	Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Higher concrete technology**	**BBV 09**		15.04.2020
Study semester: 4th semester / Offered in: SS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: All	Responsible for module: Prof. Dr.-Ing. Iris Marquardt	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Basic principles of concrete technology
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

- Skills for application-specific selection of concretes and for specifying and ordering concrete
- Acquisition of in-depth knowledge on the professional execution of concrete structures (processing, curing, quality monitoring)
- Recognition of concrete-technological correlations in the construction process
- Assessment of the influences on the durability of concrete and derivation of appropriate measures
- Recognize damage potential on concrete components and prevent damage

Contents:

- Concrete raw materials
- Fresh and hardened concrete properties
- Specifying and ordering concrete
- Production and delivery of concrete
- Construction execution
- Monitoring concrete at building sites
- Concrete for special applications: including high-strength and ultra-high-strength concrete, self-compacting concrete, concrete for massive structures, concrete for hydraulic structures, fair-faced concrete
- Durability of concrete
- Damages to concrete structures and their prevention

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. Iris Marquardt	4 LVS	Course attendance time		Home study	
	-	Lecture	60 h	Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Special fields of solid construction and FEM**	**BBV-33**		20.07.2021
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Structural civil engineering	Responsible for module: Prof. Dr.-Ing. Martin Klaus	Type of teaching, group size, if applicable: Lecture and exercise		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	BB 3-7 (Solid construction 1), BB 4-6 (Solid construction: 2)
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) Student research paper without colloquium	50% exam and 50% student research paper

Module objectives/desired learning outcomes:

The module is divided into the subsections of special fields of solid construction and the Finite Element Method (FEM).

Subsection: Solid construction
Students expand their skills for the design and for the dimensioning of special reinforced concrete components. They are able to handle statically indeterminate bracing systems in building construction. Students are able to calculate slab structures and develop, design and construct simple beam models correctly. They have knowledge of the integration of torsional stresses within the framework of the shear force design of beam components made of reinforced concrete.

Subsection: FEM
Students are able to calculate simple beam and plate structures using the finite element method and specifically apply FE programs from engineering practice. They understand how to interpret error messages from the software and calculation results and convert them into execution plans.

Contents:

Special fields of solid construction
- Design of bracing systems in solid construction (Bracing systems part 1)
- Disc-type components (part 1)
- Bar models and design of discontinuity areas (part 1)
- Torsional stresses and design in reinforced concrete structures

FEM
- Historical development
- Explanation of the main features of the theory of FEM using the example of a beam structure
- Application of a commercial program from engineering practice for the calculation of spatial beam structures
- Application of a commercial program from the engineering practice for the calculation of surface structures
- Interpretation and conversion of calculation results of an FEM calculation into a reinforcement plan

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr.-Ing. Martin Klaus	2 LVS	Course attendance time		Home study	
Prof. Dr.-Ing. habil. Michael Hansen	2 LVS	Lecture	45 h	Course accompanying and exam preparation	120 h
	-	Exercise	15 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Prestressed concrete and prefabricated construction 1**	**BBV-34**		20.07.2021
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Structural civil engineering	Responsible for module: Prof. Dr.-Ing. Martin Klaus	Type of teaching, group size, if applicable: Lecture and exercise		
Can also be credited to study program: -		Language of instruction: German		
Requirements according to examination regulations		Recommended prerequisites: Solid construction 1 (BB 3-6) und Solid construction: 2 (BB 4-6)		
Study/examination achievements/ examination types: Written examination (K2) -		If applicable, weighting of the study/examination achievements		

Module objectives/desired learning outcomes:

The module is divided into two subsections, prestressed concrete construction and precast construction.

Prestressed concrete construction:
Compared to reinforced concrete structures, the design of prestressed concrete structures requires increased effort in planning and calculation. The students acquire basic knowledge for the calculation of statically determinate prestressed concrete structures. They are able to understand and calculate simple prestressed structures.

Prefabricated construction:
The design, construction and calculation of precast structures differs from the procedure for concrete structures on location. Students learn about the planning process and the special features of the calculation and production of prefabricated structures. They are able to understand the specifics in precast design and can design and calculate a variety of precast elements in building construction.

Contents:

Prestressed concrete construction:
- Historical development, prestressing process
- Determining the tendon profile
- Determination of internal forces for statically determined prestressed concrete components taking into account all prestressing losses
- Dimensioning prestressed concrete parts in the ultimate limit states
- Structural design of prestressed concrete components

Prefabricated construction:
- Historical development, special features of the planning and construction process
- Requirements for a design suitable for finished parts
- Getting to know FT type programs
- Special features regarding the execution planning
- Planning and dimensioning special standardized connections

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. Martin Klaus	4 LVS	Course attendance time		Home study	
	-	Lecture	45 h	Course accompanying and exam preparation	120 h
	-	Exercise	15 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study		Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering		**Basic principles of bridge building**	**BBV-36**		21.06.2021
Study semester	Offered in		Credit points		Semester week hours
5th semester	WS		6 CP		4 SWS
Allocation to study specialization		Responsible for module	Type of teaching, group size, if applicable		
Structural civil engineering		Prof. Dr.-Ing. Martin Klaus	Lecture and exercise		
Can also be credited to study program			Language of instruction		
-			German		

Requirements according to examination regulations	Recommended prerequisites
	Solid construction 1/2 (BB 3-7/BB 4-6); parallel: So. Solid construction (BBV-33)
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Student research paper without colloquium -	

Module objectives/desired learning outcomes:

Students learn about and understand the basics of bridge construction and building aid.

They become familiar with the terminology used in bridge building. They have an overview of load assumptions and are familiar with various bridge systems, primarily in solid bridge construction. They are able to design and calculate substructures such as piers and abutments. Furthermore, they are familiar with construction procedures and have an understanding of the design and calculation of falsework/shoring.

Contents:

- General load-bearing systems in bridge construction
- Load assumptions in road bridge construction
- Building processes
- Design and calculation of substructures
- Calculating simple falsework/shoring

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. Martin Klaus	4 LVS	Course attendance time		Home study	
	-	Lecture	30 h	Course accompanying and exam preparation	120 h
	-	Exercise	30 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Steel engineering**	**BBV-37**		01.09.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Structural civil engineering	Responsible for module: Prof. Dr.-Ing. Stefanie Steppeler	Type of teaching, group size, if applicable: Lecture with integrated exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	BB 1-4, BB 2-4, BB 4-5
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

Students
- are proficient in the design and construction of articulated and flexurally rigid connections in steel structures,
- can apply the verification of local load transfer with and without the formation of stiffeners in steel structures,
- detect components in steel construction that are at risk in terms of stability,
- are proficient in the basic checks of bar-shaped components in steel construction that are susceptible to stability issues.

Contents:

- Design and construction of articulated and flexurally rigid connections in steel structures
- Verification of local load transfer with and without the formation of stiffeners in steel structures
- Introduction to the phenomena of stability specific to steel construction
- Fundamentals of the design of bar-shaped components in steel construction that are at risk of stability problems (flexural buckling, elasticity theory of the second order, flexural torsional buckling)

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. S. Steppeler	4 LVS	Course attendance time		Home study	
	-	Lecture	60 h	Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Wood engineering**	**BBV-38**		24.08.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Structural civil engineering	Responsible for module: Prof. Dr.-Ing. Volker Krämer	Type of teaching, group size, if applicable: Lecture and exercise		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Wood engineering:
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

Students
- learn further joining techniques in timber construction and how to verify them in accordance with standards,
- are also able to determine the compliance of lanyards and the influence of compliance on internal forces and buckling lengths,
- learn how to determine internal forces on composite members (rigid and yielding) and how to verify composite members,
- learn to design and verify large-format timber components, with non-parallel component edges.

Contents:

- Methods of joining in carpentry
- Specially designed dowels
- Screws
- Yielding of connections
- Bending resistant connections, spring stiffnesses
- Composite components
- Pitched roof girders
- Saddle roof girders (straight / curved bottom chord)

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. V. Krämer	4 LVS	Course attendance time		Home study	
	-	Lecture	40 h	Course accompanying and exam preparation	120 h
	-	Exercise	20 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Water management and water engineering**	**BBV 62**		01.09.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Water and traffic engineering	Responsible for module: Prof. Dr.-Ing. Axel Stödter	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	BB 3-5 Basic principles of hydraulics
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

Students understand hydrologic and river engineering relationships and learn terms related to the field. They should have basic knowledge of the structure of hydraulic engineering facilities, understand their uses, and comprehend their hydrologic design.

Contents:

- Water management and water balance
- Engineering hydrology
- Statistics and modeling
- Basic terminology and structure of hydraulic engineering facilities
- Hydroelectric power plants
- Hydraulic engineering uses

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. A. Stödter	4 LVS	Course attendance time		Home study	
	-	Lecture	60 h	Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study		Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering		**Water engineering in actual practice**	**BBV-63**		18.05.2021
Study semester	Offered in		Credit points		Semester week hours
5th semester	WS		6 CP		4 SWS
Allocation to study specialization		Responsible for module	Type of teaching, group size, if applicable		
Water and traffic engineering		Prof. Dr. Axel Stödter	Exercises Workshop/excursion		
Can also be credited to study program			Language of instruction		
-			German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Student research paper with colloquium -	

Module objectives/desired learning outcomes:

- Part: Water engineering lab
Students gain practical knowledge of the functional relationships between hydraulic systems. To do so, they conduct experiments in a hydraulic engineering lab.
- Part: Workshop/excursion
In addition, participation in a workshop or field trip to view selected hydraulic engineering facilities and discuss current needs with operators is mandatory. A good working knowledge of English may also be required.
Alternatively, other practical exercise components/workshops/excursions with the same module objectives are possible.
- Overarching learning objectives:
They are enabled to develop their own learning strategies and conduct independent research. Within the project work they develop their own team, conflict, facilitation and leadership skills. The project improves their motivation, professional open-mindedness and agility, as well as their creativity.

Contents:

- Models of hydraulic engineering plant components and the laws governing them
- Experiments on gravity feeders and pipelines
- Participation in a national/international workshop/excursion in a hydraulic engineering/water management context

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. Axel Stödter	4 LVS	Course attendance time		Home study	
	-	Lecture	30 h	Course accompanying and exam preparation	120 h
	-	Exercise	30 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study		Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering		**Drinking water and wastewater networks**	**BBV 64**		01.09.2018
Study semester	Offered in		Credit points		Semester week hours
5th semester	WS		6 CP		4 SWS
Allocation to study specialization		Responsible for module	Type of teaching, group size, if applicable		
Water and traffic engineering		Prof. Dr.-Ing. Günther Bahre	Lecture with exercises		
Can also be credited to study program			Language of instruction		
-			German		

Requirements according to examination regulations	Recommended prerequisites
	Successful completion of module BB 3-3
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K2) -	

Module objectives/desired learning outcomes:

- Students extend their previous knowledge from the Hydromechanics module (3rd semester) and learn the applications for the hydraulic design of drinking water and wastewater networks, taking into account the limits of the process.
- They are able to define complete systems for potable water supply and dimension the major individual elements.
- They master the tools needed to construct drinking water and wastewater networks.
- They have basic knowledge and skills to renovate wastewater networks.

Contents:

- Collection of basic data on drinking water and wastewater volumes
- Practical methods and tools for hydraulic calculation of partially and fully filled pipelines
- Calculation and dimensioning of drinking water networks including storage tanks and pumping stations
- Calculation and dimensioning of wastewater networks including verification methods by hydrodynamic calculation
- Construction of pipelines using open and trenchless methods
- Testing for leaks
- Causes of damage, damage identification and assessment as well as rehabilitation of wastewater pipes

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. G. Bahre	4 LVS	Course attendance time		Home study	
	-	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Exercise units

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Drinking water, wastewater, waste in developing countries**	**BBV 66**		01.09.2018
Study semester: 5th semester / Offered in SS:		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Water and traffic engineering	Responsible for module: Prof. Dr.-Ing. Günther Bahre	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -		Language of instruction: German		
Requirements according to examination regulations		Recommended prerequisites: Successful completion of module BB 3-3		
Study/examination achievements/ examination types: Seminar paper -		If applicable, weighting of the study/examination achievements		

Module objectives/desired learning outcomes:

- Students recognize the connections between the health of an area's population and drinking water supply or wastewater disposal.
- They recognize the economic and ecological interrelationships in supply and disposal.
- They learn about alternative processes for drinking water treatment and wastewater treatment (especially those with low resource requirements)
- and can realistically assess their application possibilities and limits.
- Students acquire basic skills in project development and implementation in the context of the international water sector.

Contents:

- Health hazards due to water
- 'Appropriate and sustainable technologies'
- Processes for drinking water production, treatment and distribution in rural and urban areas
- Processes for decentralized and centralized treatment of wastewater
- Alternative drainage systems (small bore sewer system, condominial system)
- Forms of organization in the drinking water and wastewater sector
- Basic principles for waste treatment and disposal

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. G. Bahre	4 LVS	Course attendance time		Home study	
	-	Lecture	60 h	Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Streets and roadways**	**BBV-67**		05.08.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Water and traffic engineering	Responsible for module: N.N.	Type of teaching, group size, if applicable: Lecture		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Participation in module BB 3-2 Traffic and water engineering
Study/examination achievements/ examination types: Student research paper with colloquium -	If applicable, weighting of the study/examination achievements

Module objectives/desired learning outcomes:

- In-depth knowledge of the legal and organizational basis for road designs
- In-depth knowledge of the planning methodology and design stages of rural roads and urban streets
- In-depth knowledge of determining the design parameters of rural roads and urban roads in accordance with the applicable guidelines of the FGSV
- Ability to create planning variants according to the previously developed target definitions
- Ability to dimension the road structure
- Decision-making for the development of traffic facilities adapted to the local area
- Ability to develop text and drawings of traffic facilities adapted to the local area
- Ability to present and defend the design

Contents:

- Planning and building law
- Planning process and design stages
- Categorization of roads according to the RIN
- Design of rural roads in site plan, elevation plan and cross sections
- At-grade and elevated intersections/junctions
- Road surfacing
- Urban road design

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Hon.-Prof. Daniel Seebo	2 LVS	Course attendance time		Home study	
Assistant lecturer	2 LVS	Lecture	60 h	Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Designing traffic facilities**	**BBV-68**		04.08.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Water and traffic engineering	Responsible for module: N.N.	Type of teaching, group size, if applicable: Seminar teaching		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Participation in module BB 3-2 Traffic and water engineering
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Student research paper with colloquium -	

Module objectives/desired learning outcomes:

- In-depth knowledge of the system interrelationships of traffic occurrence
- In-depth knowledge regarding the general conditions affecting the traffic volume
- Understanding of the dependencies between traffic volume and the quality of traffic flow
- Ability to carry out the evaluation of the quality of the traffic facility from the point of view of traffic engineering and the user
- Basic understanding of simulation tasks

Contents:

- Basic principles and definitions from the current reference works
- Dimensioning elevated intersections
- Dimensioning at-grade intersections with and without traffic signals
- Dimensioning route sections
- Introduction to the VISSIM program system
- Network processing and traffic control
- Motion models and visualization of traffic flows

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Hon.-Prof. Dr. D. Seebo	4 LVS	Course attendance time		Home study	
	-	Lecture	60 h	Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Railroad construction**	**BBV-69**		01.09.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Water and traffic engineering	Responsible for module: N.N.	Type of teaching, group size, if applicable: Lecture with exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
none	Participation in module BB 3-2 Traffic and water engineering
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Student research paper with colloquium -	

Module objectives/desired learning outcomes:

Students
- are able to carry out routing calculations,
- know the basics of operations control technology and signaling in rail transport,
- know the legal regulations and ordinances for rail transport, SPNV and SPFV,
- are able to design railroad facilities and plan construction execution.

Contents:

- Calculation of permissible speeds in the travel path
- Lines and design of railroad facilities Substructure and superstructures
- Signal planning in the station and track area
- Determining train sequences Basic principles of operations control in the main signal, pre-signaling system and when driving on electric sight in high-speed traffic
- Travel time calculations
- Construction operations planning for construction work while maintaining railroad operations Intermittent single-track operation, track-change operation, signalized wrong-way operation, driving on command

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
N.N.	4 LVS	Course attendance time		Home study	
	-	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Traffic engineering in actual practice**	**BBV-70**		04.08.2018
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Water and traffic engineering	Responsible for module: N.N.	Type of teaching, group size, if applicable: Seminar teaching/workshop		
Can also be credited to study program: -		Language of instruction: German and English		

Requirements according to examination regulations	Recommended prerequisites
	Participation in module BB3-2 Traffic and water engineering
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Student research paper without colloquium -	

Module objectives/desired learning outcomes:

- Knowledge and understanding of system interrelationships in traffic planning
- Knowledge of practical interrelationships in the traffic sector
- Ability to set up strategies in a working group as a key competence (group management)
- Ability to engage in technical discussion, evaluation of strategies, and decision making
- Ability to evaluate solution approaches and design variants
- Writing planning and drafting papers appropriate to the system

Contents:

Possible contents depending on the task:
- Traffic strategies
- Traffic concepts
- Marketing strategies
- Order procurement
- Services and fees
- Practical training in the project
- Liability issues

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Dipl.-Ing. A. Markwart, M.Sc.	4 LVS	Course attendance time		Home study	
	-	Lecture	30 h	Course accompanying and exam preparation	120 h
	-	Exercise	30 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Current topics from streets and roadways**	**BBV-71**		04.08.2018
Study semester: 5th semester / Offered in SS:		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Water and traffic engineering	Responsible for module: N.N.	Type of teaching, group size, if applicable: Seminar teaching		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Participation in module BB 3-2 Streets and roadways
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K1) Student research paper without colloquium	Exam 50% , student research paper 50%

Module objectives/desired learning outcomes:

Communication of knowledge and skills from a variety of current transportation topics The following descriptions of contents are to be understood as examples and are subject to change.

Contents:

Part 1: Computer-aided design planning in road engineering:
- Introduction to the structure of the program system
- Coordinate management, digital terrain model, site plan editing
- Introduction to street and road routing
- Axis and gradient processing
- Terrain profile determination, cross sections, profile processing
- Preparation of site plan drawings, axis drawings, elevation drawings, profile drawings

Part 2: Road construction and maintenance:
- Basic principles of recording, evaluating and forecasting road conditions with regard to serviceability and substance
- Road construction methods and measures for road maintenance

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Hon.-Prof. Daniel Seebo	2 LVS	Course attendance time		Home study	
Assistant lecturer	2 LVS	Lecture	60 h	Course accompanying and exam preparation	120 h
	-	Exercise			
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Building operations 3**	**BBV 81**		25.01.2019
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Building operations, construction Management	Responsible for module: Prof. Dr.-Ing. Mario Hanusrichter	Type of teaching, group size, if applicable: Lecture, exercise		
Can also be credited to study program: -		Language of instruction: German		
Requirements according to examination regulations		Recommended prerequisites: Building operations 1 and 2		
Study/examination achievements/ examination types: Written examination (K2) -		If applicable, weighting of the study/examination achievements		

Module objectives/desired learning outcomes:

Construction industry II:
Students acquire in-depth knowledge of the organization of construction and the interaction of the various parties involved. The focus in this course is on the economic aspects in the context of contract execution. The knowledge acquired in the lectures is applied and expanded in a practical manner in the form of exercises.

Building technology II:
Students acquire advanced knowledge of special aspects of construction engineering (especially construction process engineering) including scheduling. In the form of an exercise, the previous knowledge of scheduling will be applied and reinforced in a practical manner.

Contents:

Construction industry II (lecture):
- Joint ventures; risks and conflicts; forms of entrepreneurship
- Cost planning according to DIN 276; architect and engineer contracts
- Securing claims for payment and performance
- Changes in performance; price adjustment; supplementary agreements; subcontractor agreements
- Work calculation and performance

evaluation construction Industry II (exercise)
- Calculation of overhead costs; calculation of special items
- Partial termination; changes in quantity (compensation calculation)

Building technology II:
- Excavation pits; construction in groundwater; formwork technology; semi-finished parts
- Underground construction; road construction; pipeline construction; bridge construction; tunnel construction
- Demolition work and disposal
- Job scheduling with exercise

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. M. Hanusrichter	4 LVS	Course attendance time		Home study	
	-	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Building supervision and site management**	**BBV 82**		25.01.2019
Study semester: 5th semester / Offered in SS:		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Building operations, construction Management	Responsible for module: Prof. Dr.-Ing. Mario Hanusrichter	Type of teaching, group size, if applicable: Lecture, exercise, seminar papers		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
	Building operations 3
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Written examination (K1) -	

Module objectives/desired learning outcomes:

Building supervision and site management (Lecture):
Students gain knowledge of the essential aspects of managing construction sites. In preparation for their career start, they examine and understand the different perspectives and tasks of the client and contractor (contractor construction manager, client construction supervisor or client object supervisor).
In addition, they learn about the fundamentals for dealing with planning and construction disruptions.
They also learn about the basics of turnkey construction as a special form of organization and contracting. In particular, a closer look is taken at special contractual features in JV (SF) contracts.

Building supervision and site management (seminar papers, exercises):
With a suitable number of participants, the students deal with the different interests of the construction parties in exercises or in the preparation and delivery of presentations and thereby improve their skills.

Seminar on construction site management: With a suitable number of participants, selected projects and typical activities of various professions are presented in lecture seminars by speakers from the construction industry.

Contents:

Building supervision and site management (lecture):
- General conditions for the job; tasks and requirements (requirements profile)
- Legal framework; client and authorities and institutions involved
- Activities of the contractor and the client site manager
- Construction site documentation; meetings and correspondence; measurement and billing
- Subcontractor deployment; performance reporting
- Identification and management of disruptions in the construction process; supplementary management
- Dealing with crises; partnership-based approaches to solutions; management discussions
- Typical regulations in GU-(SF) contracts; concretization of the performance target; sampling
- Selected technical aspects of general development
- Interface problems; tolerances; acceptance

Building supervision and site management (seminar papers, exercise):
- Addenda; acceptance, securities, concerns, disturbed construction process
- Processing of a quotation calculation, negotiation; presentation

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. M. Hanusrichter	4 LVS	Course attendance time		Home study	
	-	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Project management**	**BBV-83**		01.04.2019
Study semester: 5th semester / Offered in: WS		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Building operations, construction Management	Responsible for module: Prof. Dr. M. Hanusrichter	Type of teaching, group size, if applicable: Lecture, exercise, seminar papers		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites

Study/examination achievements/ examination types	If applicable, weighting of the study/examination achievements
Student research paper with colloquium -	Presentation: if applicable, part of the examination (see below)

Module objectives/desired learning outcomes:

Project management (lecture):
Students acquire knowledge of the organizational tasks of all those involved in construction as well as the basic features of national and international project management standards and methods. In addition, students learn about the basic organization of projects (structures, processes and products).
Students should be able to use the basic tools for planning and controlling the parameters of deadlines, costs, and quality. Knowledge of the relationship between technology and the organization of execution should give them an overall view of project execution. They should know the project structures and project elements as a result. They can select and apply the most important tools for scheduling, cost and quality control for construction and operation for specific purposes. They learn the basics of how to think and act in order to manage projects in a target-oriented manner. Students acquire basic knowledge of the topics DIGITALIZATION (DIGITAL DESIGN AND CONSTRUCTION) and LEAN CONSTRUCTION.
Project management (seminar papers, exercises):
With a suitable number of participants, students deal with the various facets of project management in exercises or in the preparation and delivery of presentations, thereby improving their skills.

Contents:

BASIC PRINCIPLES OF PROJECT MANAGEMENT: Introduction to project management; project management standards and methods; project organization:
Structures, processes and products in construction projects; boundary conditions of the project

SCHEDULING: Basic principles of goal-oriented control; project organization; structure of projects; methods, tools; work objectives; time planning, sequence planning
COST CONTROL: Cost control on the side of the client; goals and tasks of cost determination and pricing at the contractor; classification of cost determination and cost control; cost types at the contractor; structure of the individual costs; sources of information for the cost types; dynamic contribution margin accounting; cost determination and pricing; determination of the enforceable market price QUALITY CONTROL: Agreement on characteristics; recognized rules of technology; suitability for the use assumed under the contract or for normal use; quality planning

DIGITALIZATION (DIGITAL DESIGN AND CONSTRUCTION): Basics of Building Information Modeling (BIM); basic ideas of BIM; benefits and influence of BIM on construction project management
LEAN CONSTRUCTION: Basic principles

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Prof. Dr. M. Hanusrichter	4 LVS	Course attendance time		Home study	
	-	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Safety and health protection**	**BBV-84**		01.12.2019
Study semester: 6th semester / Offered in SS:		Credit points: 6 CP		Semester week hours: 4 SWS
Allocation to study specialization: Building operations, construction Management	Responsible for module: Prof. Dr. M. Hanusrichter	Type of teaching, group size, if applicable: Lecture, exercise		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types: Written examination (K2) -	**If applicable, weighting of the study/examination achievements**

Module objectives/desired learning outcomes:

Safety and health protection during construction work (lecture):
- Acquisition of basic knowledge in health protection and occupational safety
- Acquisition of "occupational safety knowledge" in accordance with the Construction Site Ordinance in conjunction with RAB 30 Annex B
- Basic knowledge on how to prepare an operational risk assessment

Safety and health protection during construction work (exercise):
- Development of a sample risk assessment

Contents:

Occupational health and safety knowledge includes general principles of occupational health and safety, identification and assessment of hazards on construction sites and during subsequent work on the building structures, as well as the protective measures required for this and the organization of occupational health and safety on construction sites.

It focuses on, among other things:
Occupational health and safety legislation and system, site-specific accident and health hazards and necessary protective measures (measures for safety mining and civil engineering work, hazards due to falling, safe use of scaffolding, safe use of ladders, mobile scaffolds and lifting platforms, hazards due to electricity, operational fire protection, hazards due to hazardous substances, measures for safety during assembly work, measures for safety during demolition and renovation work, safe use of machinery and equipment), first aid facilities, day shelters, washrooms, toilets and other facilities, personal protective equipment

Based on this, students are gradually introduced to the preparation of a risk assessment for a construction company.

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
Assistant lecturer Dipl.-Ing. K. Oetke	4 LVS	Course attendance time		Home study	
	-	Lecture	50 h	Course accompanying and exam preparation	120 h
	-	Exercise	10 h		
	-	Other			
Total classroom time	**4 LVS**	**Total workload**			**180 h**

Optional extra

Acquisition of the qualification for special coordinator knowledge according to Annex C (BaustellV, RAB 30), if applicable

Literature
is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Practical training project**	**BBV 98**		01.09.2018
Study semester: 7th semester / Offered in WS: + SS		Credit points: 6 CP		Semester week hours: n/a
Allocation to study specialization: All	Responsible for module: N.N.	Type of teaching, group size, if applicable: Supervised external project		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types: Student research paper without colloquium -	If applicable, weighting of the study/examination achievements

Module objectives/desired learning outcomes:

Practical training projects can be carried out in all the subject areas of civil engineering

Depending on the task, a subject-specific or interdisciplinary project with high practical relevance is carried out in cooperation with an engineering firm, a company, a specialist authority, etc. Students deal with a task that is narrowly defined in terms of content and scope, carry out experimental (laboratory/field) investigations if necessary, and work out solutions largely independently. They are able to assess the effects and consequences of the solutions they have developed themselves, and they can make technical and economic assessments and classifications.

Contents:

Practical projects with different focuses from the fields of Structural engineering, water engineering, traffic engineering, construction operation/management, geotechnical engineering or interdisciplinary

The assignment is coordinated with the students, the project partners and the supervisors for the intended task of the Bachelor's thesis and takes into account the specialization (major) chosen by the students.

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
entire teaching staff, per student	0.2 LVS	Course attendance time		Home study	
	-	Lecture		Course accompanying and exam preparation	177 h
	-	Exercise			
	-	Other	3 h		
Total classroom time	**0.2 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

Allocation to course of study	Module name	Course code	Internal	Last updated
Bachelor of Civil Engineering	**Special project**	**BBV 99**		01.09.2018
Study semester: 5th semester / Offered in WS: + SS		Credit points: 6 CP		Semester week hours: n/a
Allocation to study specialization: All	Responsible for module: N.N.	Type of teaching, group size, if applicable: Project with (lab and field) exercises		
Can also be credited to study program: -		Language of instruction: German		

Requirements according to examination regulations	Recommended prerequisites
Study/examination achievements/ examination types	**If applicable, weighting of the study/examination achievements**
Student research paper with colloquium -	

Module objectives/desired learning outcomes:

Practical training projects can be carried out in all the subject areas of civil engineering

Depending on the task, a subject-specific or interdisciplinary project with high practical relevance is carried out in cooperation with an engineering firm, a company, a specialist authority, etc., in which the student, largely independently, develops solutions that are designed to assess follow-up effects and provide technical and economic evaluations.

Contents:

Practical projects with different focuses from the fields of Structural engineering, water engineering, traffic engineering, construction operation/management, geotechnical engineering or interdisciplinary

The assignment will take into account the specialization/major chosen by the student.

Course attendance time (in mandatory hours - LVS)		**Workload** (in hours)			
All professors, per student	0.2 LVS	Course attendance time		Home study	
	-	Lecture		Course accompanying and exam preparation	177 h
	-	Exercise			
	-	Other	3 h		
Total classroom time	**0.2 LVS**	**Total workload**			**180 h**

Optional extra

Literature

is listed in Stud.IP

March 2022

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